

Table 6.35: Volumetric Equivalents (30)

The following table will be helpful in the preparation of reports showing disposition of 190 proof and anhydrous (200 proof) tax-free and specially denatured alcohol.

Fluid Ounces	Milliliters	Wine Gallons	Proof Gallons	
			190 proof	200 proof
1	30.	0.008	0.015	0.016
2	59.	.016	.030	.031
3	89.	.023	.045	.047
4	118.	.031	.059	.062
5	148.	.039	.074	.078
6	177.	.047	.088	.094
7	207.	.055	.103	.109
8	237.	.063	.119	.125
9	266.	.070	.134	.140
10	296.	.078	.149	.156
11	325.	.086	.164	.172
12	355.	.094	.179	.187
13	385.	.102	.194	.203
14	414.	.109	.209	.218
15	444.	.117	.224	.234
16 (1 pint)	473.	.125	.238	.250
32 (1 quart)	946.	.250	.475	.500
64 (2 quarts)	1892	.500	.950	1.000
96	2839	.750	1.425	1.500
128 (1 U.S. gallon)	3785	1.000	1.900	2.000
		5.000	9.500	10.000
		30.000	57.000	60.000
		54.000	102.600	108.000
		55.000	104.500	110.000

Table 6.36: Ethyl Alcohol-Water Mixtures (30)

Corresponding values for proof, parts by volume of water and alcohol, weight % alcohol and specific gravity in air.

U.S. PROOF degrees at 60°F	PARTS BY VOLUME* OF		WEIGHT % ETHYL ALCOHOL	SPECIFIC GRAVITY		
	WATER	ETHYL ALCOHOL		at 60°/60°F (15.56°/15.56°C)	at 68°/68°F (20°/20°C)	at 77°/77°F (25°/25°C)
0	100.00	0.0	0.00	1.0000	1.0000	1.0000
1	99.53	0.5	0.40	.9992	.9992	.9992
2	99.06	1.0	0.80	.9985	.9985	.9985
3	98.58	1.5	1.19	.9978	.9978	.9978
4	98.12	2.0	1.59	.9970	.9970	.9970
5	97.65	2.5	1.99	.9963	.9963	.9963

*The parts by volume of water and the parts by volume of ethyl alcohol do not add to unity (100) at any one proof reading, because of the shrinkage in volume which occurs when ethyl alcohol and water are mixed. The parts by volume of ethyl alcohol are the same as percent by volume of ethyl alcohol used to determine proof for tax purposes. Ethyl alcohol proof, by legal definition, is twice the percent by volume.

(continued)

Table 6.36: (continued)

U.S. PROOF degrees at 60°F	PARTS BY VOLUME* OF		WEIGHT % ETHYL ALCOHOL	SPECIFIC GRAVITY		
	WATER	ETHYL ALCOHOL		at 60°/60°F (15.56°/15.56°C)	at 68°/68°F (20°/20°C)	at 77°/77°F (25°/25°C)
6	97.18	3.0	2.39	.9956	.9956	.9956
7	96.71	3.5	2.79	.9949	.9949	.9948
8	96.24	4.0	3.19	.9942	.9942	.9941
9	95.78	4.5	3.60	.9935	.9935	.9934
10	95.31	5.0	4.00	.9928	.9928	.9927
11	94.85	5.5	4.40	.9921	.9921	.9921
12	94.39	6.0	4.80	.9915	.9914	.9914
13	93.93	6.5	5.21	.9908	.9908	.9907
14	93.46	7.0	5.61	.9902	.9902	.9901
15	93.01	7.5	6.02	.9896	.9895	.9894
16	92.55	8.0	6.42	.9890	.9889	.9888
17	92.09	8.5	6.83	.9884	.9883	.9882
18	91.63	9.0	7.23	.9878	.9876	.9875
19	91.18	9.5	7.64	.9872	.9870	.9869
20	90.72	10.0	8.05	.9866	.9864	.9863
21	90.27	10.5	8.46	.9860	.9858	.9856
22	89.81	11.0	8.86	.9854	.9852	.9850
23	89.36	11.5	9.27	.9848	.9846	.9844
24	88.90	12.0	9.68	.9843	.9840	.9838
25	88.45	12.5	10.09	.9837	.9835	.9832
26	88.00	13.0	10.50	.9832	.9829	.9826
27	87.55	13.5	10.91	.9826	.9823	.9820
28	87.10	14.0	11.32	.9821	.9817	.9814
29	86.65	14.5	11.73	.9816	.9812	.9808
30	86.20	15.0	12.14	.9810	.9806	.9802
31	85.75	15.5	12.55	.9805	.9801	.9796
32	85.30	16.0	12.96	.9800	.9797	.9790
33	84.85	16.5	13.37	.9794	.9790	.9784
34	84.40	17.0	13.79	.9789	.9784	.9778
35	83.95	17.5	14.20	.9784	.9779	.9773
36	83.50	18.0	14.61	.9779	.9773	.9767
37	83.06	18.5	15.03	.9774	.9768	.9761
38	82.61	19.0	15.44	.9769	.9763	.9756
39	82.16	19.5	15.85	.9764	.9757	.9750
40	81.72	20.0	16.27	.9759	.9752	.9744
41	81.27	20.5	16.68	.9754	.9747	.9739
42	80.82	21.0	17.10	.9749	.9741	.9733
43	80.38	21.5	17.52	.9744	.9736	.9727
44	79.93	22.0	17.93	.9739	.9731	.9721

*The parts by volume of water and the parts by volume of ethyl alcohol do not add to unity (100) at any one proof reading, because of the shrinkage in volume which occurs when ethyl alcohol and water are mixed. The parts by volume of ethyl alcohol are the same as percent by volume of ethyl alcohol used to determine proof for tax purposes. Ethyl alcohol proof, by legal definition, is twice the percent by volume.

(continued)

Table 6.36: (continued)

U.S. PROOF degrees at 60°F	PARTS BY VOLUME* OF		WEIGHT % ETHYL ALCOHOL	SPECIFIC GRAVITY		
	WATER	ETHYL ALCOHOL		at 60°/60°F (15.56°/15.56°C)	at 68°/68°F (20°/20°C)	at 77°/77°F (25°/25°C)
45	79.48	22.5	18.35	.9734	.9725	.9715
46	79.03	23.0	18.77	.9729	.9720	.9710
47	78.58	23.5	19.19	.9724	.9714	.9704
48	78.14	24.0	19.60	.9718	.9708	.9698
49	77.69	24.5	20.02	.9713	.9703	.9692
50	77.24	25.0	20.44	.9708	.9697	.9686
51	76.79	25.5	20.86	.9703	.9691	.9679
52	76.34	26.0	21.28	.9697	.9686	.9673
53	75.89	26.5	21.71	.9692	.9680	.9667
54	75.44	27.0	22.13	.9687	.9674	.9661
55	74.98	27.5	22.55	.9681	.9668	.9654
56	74.53	28.0	22.97	.9676	.9662	.9648
57	74.08	28.5	23.40	.9670	.9656	.9642
58	73.62	29.0	23.82	.9664	.9650	.9635
59	73.17	29.5	24.24	.9659	.9644	.9629
60	72.72	30.0	24.67	.9653	.9638	.9622
61	72.26	30.5	25.10	.9647	.9632	.9616
62	71.81	31.0	25.52	.9641	.9626	.9609
63	71.35	31.5	25.95	.9635	.9619	.9602
64	70.89	32.0	26.38	.9629	.9613	.9595
65	70.13	32.5	26.81	.9623	.9606	.9588
66	69.97	33.0	27.24	.9616	.9599	.9581
67	69.51	33.5	27.67	.9610	.9593	.9574
68	69.05	34.0	28.10	.9604	.9586	.9567
69	68.59	34.5	28.54	.9597	.9579	.9559
70	68.12	35.0	28.97	.9590	.9572	.9552
71	67.66	35.5	29.41	.9584	.9565	.9544
72	67.19	36.0	29.84	.9576	.9557	.9537
73	66.72	36.5	30.28	.9570	.9550	.9529
74	66.25	37.0	30.72	.9562	.9542	.9521
75	65.78	37.5	31.16	.9555	.9535	.9513
76	65.31	38.0	31.60	.9548	.9527	.9505
77	64.84	38.5	32.04	.9540	.9519	.9497
78	64.37	39.0	32.48	.9533	.9512	.9489
79	63.90	39.5	32.92	.9525	.9504	.9481
80	63.42	40.0	33.36	.9517	.9496	.9473
81	62.95	40.5	33.81	.9509	.9488	.9464
82	62.47	41.0	34.25	.9501	.9479	.9456
83	61.99	41.5	34.70	.9493	.9471	.9447

*The parts by volume of water and the parts by volume of ethyl alcohol do not add to unity (100) at any one proof reading, because of the shrinkage in volume which occurs when ethyl alcohol and water are mixed. The parts by volume of ethyl alcohol are the same as percent by volume of ethyl alcohol used to determine proof for tax purposes. Ethyl alcohol proof, by legal definition, is twice the percent by volume.

(continued)

Table 6.36: (continued)

U.S. PROOF degrees at 60°F	PARTS BY VOLUME* OF		WEIGHT % ETHYL ALCOHOL	SPECIFIC GRAVITY		
	WATER	ETHYL ALCOHOL		at 60°/60°F (15.56°/15.56°C)	at 68°/68°F (20°/20°C)	at 77°/77°F (25°/25°C)
84	61.52	42.0	35.15	.9485	.9463	.9439
85	61.04	42.5	35.60	.9477	.9454	.9430
86	60.56	43.0	36.05	.9469	.9446	.9421
87	60.08	43.5	36.50	.9460	.9437	.9412
88	59.59	44.0	36.96	.9452	.9428	.9403
89	59.11	44.5	37.41	.9443	.9419	.9394
90	58.63	45.0	37.86	.9434	.9410	.9385
91	58.14	45.5	38.32	.9426	.9402	.9376
92	57.66	46.0	38.78	.9417	.9292	.9366
93	57.17	46.5	39.24	.9408	.9383	.9357
94	56.68	47.0	39.70	.9399	.9374	.9348
95	56.19	47.5	40.16	.9389	.9364	.9338
96	55.70	48.0	40.62	.9380	.9355	.9328
97	55.21	48.5	41.09	.9371	.9345	.9319
98	54.72	49.0	41.55	.9361	.9336	.9309
99	54.22	49.5	42.02	.9352	.9326	.9299
100	53.73	50.0	42.49	.9342	.9316	.9289
101	53.24	50.5	42.96	.9332	.9306	.9279
102	52.74	51.0	43.43	.9322	.9296	.9269
103	52.25	51.5	43.90	.9312	.9286	.9258
104	51.75	52.0	44.37	.9302	.9276	.9248
105	51.25	52.5	44.85	.9292	.9266	.9238
106	50.75	53.0	45.33	.9282	.9256	.9228
107	50.26	53.5	45.80	.9272	.9245	.9217
108	49.76	54.0	46.28	.9262	.9235	.9207
109	49.26	54.5	46.76	.9252	.9225	.9196
110	48.76	55.0	47.24	.9241	.9214	.9185
111	48.25	55.5	47.73	.9230	.9204	.9175
112	47.75	56.0	48.21	.9220	.9193	.9164
113	47.25	56.5	48.70	.9210	.9182	.9153
114	46.75	57.0	49.19	.9199	.9171	.9142
115	46.24	57.5	49.68	.9188	.9161	.9131
116	45.74	58.0	50.17	.9177	.9150	.9120
117	45.23	58.5	50.66	.9166	.9139	.9109
118	44.72	59.0	51.15	.9156	.9128	.9098
119	44.22	59.5	51.65	.9144	.9116	.9087
120	43.71	60.0	52.15	.9133	.9105	.9076
121	43.20	60.5	52.65	.9122	.9094	.9064
122	42.69	61.0	53.15	.9111	.9083	.9053

*The parts by volume of water and the parts by volume of ethyl alcohol do not add to unity (100) at any one proof reading, because of the shrinkage in volume which occurs when ethyl alcohol and water are mixed. The parts by volume of ethyl alcohol are the same as percent by volume of ethyl alcohol used to determine proof for tax purposes. Ethyl alcohol proof, by legal definition, is twice the percent by volume.

(continued)

Table 6.36: (continued)

U.S. PROOF degrees at 60°F	PARTS BY VOLUME* OF		WEIGHT % ETHYL ALCOHOL	SPECIFIC GRAVITY		
	WATER	ETHYL ALCOHOL		at 60°/60°F (15.56°/15.56°C)	at 68°/68°F (20°/20°C)	at 77°/77°F (25°/25°C)
123	42.18	61.5	53.65	.9100	.9071	.9041
124	41.67	62.0	54.15	.9088	.9060	.9030
125	41.16	62.5	54.66	.9077	.9048	.9018
126	40.65	63.0	55.16	.9065	.9037	.9006
127	40.14	63.5	55.67	.9054	.9025	.8995
128	39.62	64.0	56.18	.9042	.9014	.8983
129	39.11	64.5	56.70	.9031	.9002	.8971
130	38.60	65.0	57.21	.9019	.8990	.8959
131	38.08	65.5	57.72	.9007	.8978	.8948
132	37.57	66.0	58.24	.8996	.8966	.8936
133	37.05	66.5	58.76	.8984	.8954	.8924
134	36.54	67.0	59.28	.8972	.8942	.8912
135	36.02	67.5	59.80	.8960	.8930	.8899
136	35.50	68.0	60.32	.8948	.8918	.8887
137	34.99	68.5	60.85	.8936	.8906	.8875
138	34.47	69.0	61.38	.8923	.8894	.8862
139	33.95	69.5	61.91	.8911	.8882	.8850
140	33.43	70.0	62.44	.8899	.8869	.8838
141	32.91	70.5	62.98	.8886	.8856	.8825
142	32.38	71.0	63.51	.8874	.8844	.8812
143	31.86	71.5	64.05	.8861	.8831	.8800
144	31.34	72.0	64.59	.8848	.8819	.8787
145	30.82	72.5	65.13	.8836	.8806	.8774
146	30.29	73.0	65.67	.8823	.8793	.8761
147	29.76	73.5	66.22	.8810	.8780	.8748
148	29.24	74.0	66.77	.8797	.8767	.8735
149	28.71	74.5	67.32	.8784	.8754	.8722
150	28.19	75.0	67.87	.8771	.8741	.8709
151	27.66	75.5	68.43	.8758	.8728	.8696
152	27.13	76.0	68.98	.8745	.8715	.8682
153	26.60	76.5	69.54	.8732	.8702	.8669
154	26.07	77.0	70.10	.8718	.8688	.8655
155	25.54	77.5	70.67	.8705	.8674	.8642
156	25.01	78.0	71.23	.8691	.8661	.8628
157	24.47	78.5	71.80	.8678	.8647	.8614
158	23.94	79.0	72.38	.8664	.8633	.8600
159	23.40	79.5	72.95	.8650	.8620	.8586
160	22.87	80.0	73.53	.8636	.8606	.8572
161	22.33	80.5	74.11	.8622	.8592	.8558

*The parts by volume of water and the parts by volume of ethyl alcohol do not add to unity (100) at any one proof reading, because of the shrinkage in volume which occurs when ethyl alcohol and water are mixed. The parts by volume of ethyl alcohol are the same as percent by volume of ethyl alcohol used to determine proof for tax purposes. Ethyl alcohol proof, by legal definition, is twice the percent by volume.

(continued)

Table 6.36: (continued)

U.S. PROOF degrees at 60°F	PARTS BY VOLUME* OF		WEIGHT % ETHYL ALCOHOL	SPECIFIC GRAVITY		
	WATER	ETHYL ALCOHOL		at 60°/60°F (15.56°/15.56°C)	at 68°/68°F (20°/20°C)	at 77°/77°F (25°/25°C)
162	21.80	81.0	74.69	.8608	.8577	.8544
163	21.26	81.5	75.27	.8594	.8563	.8530
164	20.72	82.0	75.86	.8580	.8549	.8516
165	20.18	82.5	76.45	.8566	.8535	.8501
166	19.64	83.0	77.04	.8552	.8520	.8487
167	19.10	83.5	77.64	.8537	.8506	.8472
168	18.55	84.0	78.23	.8522	.8491	.8458
169	18.01	84.5	78.84	.8508	.8476	.8443
170	17.46	85.0	79.44	.8493	.8461	.8428
171	16.92	85.5	80.05	.8478	.8446	.8413
172	16.37	86.0	80.66	.8462	.8431	.8398
173	15.82	86.5	81.28	.8447	.8416	.8382
174	15.27	87.0	81.90	.8432	.8400	.8367
175	14.72	87.5	82.52	.8416	.8385	.8351
176	14.16	88.0	83.14	.8401	.8369	.8335
177	13.61	88.5	83.78	.8385	.8353	.8319
178	13.05	89.0	84.41	.8369	.8337	.8303
179	12.49	89.5	85.05	.8353	.8321	.8287
180	11.93	90.0	85.69	.8336	.8305	.8271
181	11.37	90.5	86.34	.8320	.8288	.8254
182	10.80	91.0	86.99	.8303	.8271	.8237
183	10.24	91.5	87.65	.8286	.8254	.8220
184	9.67	92.0	88.31	.8268	.8237	.8203
185	9.09	92.5	88.98	.8251	.8219	.8185
186	8.52	93.0	89.65	.8233	.8201	.8167
187	7.94	93.5	90.34	.8215	.8183	.8149
188	7.36	94.0	91.02	.8196	.8164	.8130
189	6.77	94.5	91.72	.8178	.8146	.8111
190	6.18	95.0	92.42	.8158	.8126	.8092
191	5.59	95.5	93.14	.8138	.8107	.8072
192	4.99	96.0	93.85	.8118	.8087	.8052
193	4.39	96.5	94.58	.8098	.8066	.8032
194	3.78	97.0	95.32	.8077	.8045	.8011
195	3.17	97.5	96.07	.8056	.8024	.7990
196	2.55	98.0	96.82	.8033	.8002	.7968
197	1.93	98.5	97.60	.8010	.7978	.7944
198	1.29	99.0	98.38	.7987	.7955	.7921
199	.65	99.5	99.19	.7962	.7930	.7896
200	.00	100.0	100.00	.7936	.7905	.7871

U.S. Department of Commerce, STANDARD DENSITY AND VOLUMETRIC TABLES, CIRCULAR OF THE BUREAU OF STANDARDS NO. 19 (Washington: U.S. Government Printing Office, 1924) pp. 8, 9 & 18

U.S. Treasury Department, GAUGING MANUAL EMBRACING INSTRUCTIONS AND TABLES FOR DETERMINING THE QUANTITY OF DISTILLED SPIRITS BY PROOF AND WEIGHT (Washington: U.S. Government Printing Office, 1970)

Specific Gravity at 20°/20°C and 25°/25°C from Table 52.003, OFFICIAL METHODS OF ANALYSIS OF THE ASSOCIATION OF OFFICIAL ANALYTICAL CHEMISTS, Twelfth Edition, 1975.

* The parts by volume of water and the parts by volume of ethyl alcohol do not add to unity (100) at any one proof reading, because of the shrinkage in volume which occurs when ethyl alcohol and water are mixed. The parts by volume of ethyl alcohol are the same as percent by volume of ethyl alcohol used to determine proof for tax purposes. Ethyl alcohol proof, by legal definition, is twice the percent by volume.